

a first chip capacitor attached to said active regions of said first semiconductor chip or to the opposite side of said active regions of said first semiconductor chip, said first chip capacitor serving to reduce power source noise.

REMARKS

These amendments and remarks are being filed in response to the final Office Action dated January 14, 2003. For the following reasons, this amendment should be entered, the application allowed, and the case passed to issue.

This amendment should be entered because it does not raise any new matter or considerations. The amendment to claim 2 merely corrects informalities. The amendment to claim 2 is supported by Figs. 2-4 and the accompanying portions of the specification, which have been previously considered.

Drawings

The Examiner asserts that all figures showing a cross-sectional view of the invention are improperly crosshatched.

In response to this objection, Applicants have submitted a Request for Approval of Drawing Amendment in a separate paper. Figures 4 and 13-21 have been corrected to show proper crosshatching. Applicants, however, traverse the Examiner's assertion that "[a]ll figures showing a cross-sectional view of the invention are improperly crosshatched." Figures 8-12 appear to be properly crosshatched. If the Examiner maintains the objection to Figures 8-12, Applicants respectfully request the Examiner to explain, with particularity, the grounds for the objection.

Claim Rejections Under 35 U.S.C. § 112

Claims 2 and 3 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite because there is allegedly "a great deal of confusion and uncertainty as to the proper interpretation of the limitations of the claims." This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested.

Claims 2 and 3 are definite and clear. "Definiteness of claim language must be analyzed . . . in light of: (A) The content of the particular application disclosure . . . and (C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made." MPEP § 2173.02. When analyzed in view of the instant specification, claims 2 and 3 are definite to one of ordinary skill in this art.

Applicants explained in the Response to Restriction Requirement of June 28, 2002, that claim 2 corresponds to Figs. 2-4. When claim 2 is interpreted in light of Figs. 2-4 and the accompanying portions of the specification, it is clear that claim 2 is definite. For example, with respect to Fig. 2:

Ref. No. 2 corresponds to the BGA substrate having one principal plane furnished with a large number of solder balls (Ref. No. 3),

Ref. No. 4 corresponds to the first semiconductor chip,

Ref. No. 5 corresponds to the bumps serving as electrodes attached to another principal plane of the BGA substrate, and

Ref. No. 6 corresponds to the first chip capacitor.

The Examiner asserts that it is unclear "how the BGA substrate has a BGA on a principal plane and the bumps . . . are attached to that same principal plane." Claim 2, however, requires that one principal plane of the BGA substrate is furnished with a large number of solder balls and that

the bumps of the semiconductor chip are attached to another principal plane of the BGA substrate. This configuration is clearly shown in FIG. 2 and 3.

Claim 3 requires that the first semiconductor chip further includes through-type via contacts extending from the active regions to the opposite side in the first semiconductor chip, and that the first chip capacitor is electrically connected to the active regions through the through-type via contacts. Figs. 3 and 4 illustrate the through-type via contacts 10. As shown in the detailed view of Fig. 4, the first chip capacitor 6 is electrically connected through the through-type via contacts 10 to the active regions 11 of the first semiconductor chip 4.

Applicants submit that claims 2 and 3 fully comport with the requirements of 35 U.S.C. § 112.

In light of the Remarks above, this amendment should be entered, the application allowed, and the case should be passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

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Attached hereto is a marked-up version of the changes made to the claims by the current amendment. This attached page is captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE."

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please amend claim 2 as follows:

2. (Twice Amended) A semiconductor device comprising:

a BGA substrate having one principal plane furnished with a large number of solder balls[,
said solder balls constituting a ball grid array];

a first semiconductor chip including bumps and active regions, said bumps and active
regions being formed on a first side of the semiconductor chip, said bumps serving as electrodes
attached to [said one] another principal plane of said BGA substrate; and

a first chip capacitor attached to said active regions of said first semiconductor chip or to the
opposite side of said active regions of said first semiconductor chip, said first chip capacitor serving
to reduce power source noise.